

WHAT IS CLAIMED IS:

1. A macro pixel, comprising:

at least two color pixel elements, each color pixel element including a photoreceptor having a device geometry, responsive to receiving light, to generate an output signal indicative of an amount of light photons received;

a first of the color pixel elements, to receive a first color, the photoreceptor of the first of the color pixel elements having a first geometry and a responsivity to light that is a function of the first geometry of the photodiode such that the responsivity of the output signal of the photoreceptor to the first color is controllable by changing the first geometry;

a second of the color pixel elements to receive a second color different than the first color, the photoreceptor of the second of the color pixel elements having a second geometry and a responsivity to light that is a function of the second geometry such that the responsivity of the output signal of the photoreceptor to the second color is controllable by changing the second geometry; and

the first geometry and the second geometry are selected such that the responsivity of the output signal of the first of the color pixel elements to the first color is a

predetermined ratio of the responsivity of the output signal of the second of the color pixel elements to the second color.

2. The macro pixel of Claim 1 wherein the photoreceptor of each color pixel element is selected from the group consisting of n-wells, n+ diffusion, p-wells, p+ diffusion, and photogates.

3. The macro pixel of Claim 1 wherein the photoreceptor of each color pixel element is an n+ diffusion.

4. The macro pixel of Claim 1 wherein the predetermined ratio is about 1:1.

5. The macro pixel of Claim 1 further comprising a third one of the color pixel elements, to receive a third color different than the first color and the second color, the photoreceptor of the third one of the color pixel elements having a third geometry and a responsivity to light that is a function of the third geometry of the photoreceptor such that the responsivity of the output signal of the photoreceptor to the third color is controllable by changing the third geometry.

6. The macro pixel of Claim 5 wherein the first geometry, the second geometry, and the third geometry are selected such that the responsivity of the output signal of the first of the color pixel elements to the first color, and the responsivity of the output signal of the second of the color pixel elements to the second color, and the responsivity of the output signal of the third one of the color pixel elements to the third color is a predetermined ratio.

7. The macro pixel of Claim 6 wherein the predetermined ratio is about 1:1:1.

8. The macro pixel of Claim 1 further comprising a microlens photonically coupled to at least one of the color pixel elements.

9. The macro pixel of Claim 6 further comprising corresponding microlenses photonically coupled to each of the color pixel elements.

10. The macro pixel of Claim 1 wherein at least one of the color pixel elements further comprises at least one switch coupled to the photoreceptor to vary the device geometry.

11. The macro pixel of Claim 10 wherein the at least one switch actively varies the device geometry.

12. Wherein the macro pixel of Claim 1 is included in a color pixel assembly, the color pixel assembly including a plurality of macro pixels.

13. A CMOS color pixel assembly, comprising;  
a plurality of macro pixels, each macro pixel of the plurality of macro pixels comprising;  
at least three color pixel elements, each color pixel element including a photoreceptor having a device geometry, responsive to receiving light, to generate an output signal indicative of an amount of light photons received;  
a first one of the color pixel elements, to receive a first color, the photoreceptor of the first one of the color pixel elements having a first geometry and a responsivity to light that is a function of the first geometry of the photoreceptor such that the responsivity of the output signal of the photoreceptor to the first color is controllable by changing the first geometry;  
a second one of the color pixel elements to receive a second color different than the first color, the photoreceptor of the second one of the color pixel elements

having a second geometry and a responsivity to light that is a function of the second geometry such that the responsivity of the output signal of the photoreceptor to the second color is controllable by changing the second geometry; and

a third one of the color pixel elements, to receive a third color different than the first color and the second color, the photoreceptor of the third one of the color pixel elements having a third geometry and a responsivity to light that is a function of the third geometry of the photoreceptor such that the responsivity of the output signal of the photoreceptor to the third color is controllable by changing the third geometry.

14. The color pixel assembly of Claim 13 wherein the first geometry, the second geometry, and the third geometry are selected such that the responsivity of the output signal of the first one of the color pixel elements to the first color, and the responsivity of the output signal of the second one of the color pixel elements to the second color, and the responsivity of the output signal of the third one of the color pixel elements to the third color is a predetermined ratio.

15. The color pixel assembly of Claim 14 wherein the predetermined ratio is about 1:1:1.

16. The color pixel assembly of Claim 13 wherein the photoreceptor of each color pixel element is selected from the group consisting of n-wells, n+ diffusion, p-wells, p+ diffusion, and photogates.

17. The color pixel assembly of Claim 13 further comprising a microlens photonically coupled to at least one of the color pixel elements.

18. The color pixel assembly of Claim 13 further comprising corresponding microlenses photonically coupled to each of the color pixel elements.

19. The color pixel assembly of Claim 13 wherein at least one of the color pixel elements further comprises at least one switch coupled to the photoreceptor to vary the device geometry.

20. The color pixel assembly of Claim 19 wherein the at least one switch actively varies the device geometry.

Patent Application

21. A macro pixel, comprising:

at least three color pixel elements, each color pixel element including a photoreceptor, responsive to receiving light, to generate an output signal indicative of an amount of light photons received;

a first of the color pixel elements, to receive a first color, the photoreceptor of the first of the color pixel elements having a first geometry and a responsivity to light that is a function of the first geometry of the photoreceptor such that the responsivity of the output signal of the photoreceptor to the first color is controllable by changing the first geometry;

a second of the color pixel elements to receive a second color different than the first color, the photoreceptor of the second of the color pixel elements having a second geometry and a responsivity to light that is a function of the second geometry such that the responsivity of the output signal of the photoreceptor to the second color is controllable by changing the second geometry; and

a third one of the color pixel elements, to receive a third color different than the first color and the second color, the photoreceptor of the third one of the color pixel elements having a third geometry and a responsivity to light that is a function of the third geometry of the photoreceptor

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such that the responsivity of the output signal of the photoreceptor to the third color is controllable by changing the third geometry.

22. The color pixel assembly of Claim 21 wherein the first geometry, the second geometry, and the third geometry are selected such that the responsivity of the output signal of the first of the color pixel elements to the first color, and the responsivity of the output signal of the second of the color pixel elements to the second color, and the responsivity of the output signal of the third one of the color pixel elements to the third color is a predetermined ratio.

23. The color pixel assembly of Claim 22 wherein the predetermined ratio is about 1:1:1.

24. The color pixel assembly of Claim 21 wherein the photoreceptor of each color pixel element is selected from the group consisting of n-wells, n+ diffusion, p-wells, p+ diffusion, and photogates.